ANNEX III

(Part-66)

66.1

For the purpose of this Part, the competent authority shall be the authority designated by the Member State to whom a person applies for the issuance of an aircraft maintenance licence.

SECTION A

SUBPART A

AIRCRAFT MAINTENANCE LICENCE AEROPLANES AND HELICOPTERS

66.A.1 Scope

(a) This section establishes the requirements for the issue of an aircraft maintenance licence and conditions of its validity and use, for aeroplanes and helicopters of the following categories:

— Category A

— Category B1

— Category B2

— Category C

(b) Categories A and B1 are subdivided into subcategories relative to combinations of aeroplanes, helicopters, turbine and piston engines. The subcategories are:

— A1 and B1.1 Aeroplanes Turbine

— A2 and B1.2 Aeroplanes Piston

— A3 and B1.3 Helicopters Turbine

— A4 and B1.4 Helicopters Piston

66.A.10 Application

An application for an aircraft maintenance licence or amendment to such licence shall be made on EASA Form 19 and in a manner established by the competent authority and submitted thereto. An application for the amendment to an aircraft maintenance licence shall be made to the competent authority that issued the aircraft maintenance licence.

66.A.15 Eligibility

An applicant for an aircraft maintenance licence shall be at least 18 years of age.

66.A.20 Privileges

(a) Subject to compliance with paragraph (b), the following privileges shall apply:

1. A category A aircraft maintenance licence permits the holder to issue certificates of release to service following minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the authorisation. The certification privileges shall be restricted to work that the licence holder has personally performed in a Part-145 organisation.
2. A category B1 aircraft maintenance licence shall permit the holder to issue certificates of release to service following maintenance, including aircraft structure, powerplant and mechanical and electrical systems. Replacement of avionic line replaceable units, requiring simple tests to prove their serviceability, shall also be included in the privileges. Category B1 shall automatically include the appropriate A subcategory.
3. A category B2 aircraft maintenance licence shall permit the holder to issue certificates of release to service following maintenance on avionic and electrical systems.
4. A category C aircraft maintenance licence shall permit the holder to issue certificates of release to service following base maintenance on aircraft. The privileges apply to the aircraft in its entirety in a Part-145 organisation.

(b) The holder of an aircraft maintenance licence may not exercise certification privileges unless:

1. in compliance with the applicable requirements of Part-M and/or Part-145.
2. in the preceding two-year period he/she has, either had six months of maintenance experience in accordance with the privileges granted by the aircraft maintenance licence or, met the provision for the issue of the appropriate privileges.
3. he/she is able to read, write and communicate to an understandable level in the language(s) in which the technical documentation and procedures necessary to support the issue of the certificate of release to service are written.

66.A.25 Basic knowledge requirements

(a) An applicant for an aircraft maintenance licence or the addition of a category or subcategory to such an aircraft maintenance licence shall demonstrate, by examination, a level of knowledge in the appropriate subject modules in accordance with Appendix I to this Part.

The basic knowledge examinations shall be conducted by a training organisation appropriately approved under Part-147 or by the competent authority.

(b) Full or partial credit against the basic knowledge requirements and associated examination shall be given for any other technical qualification considered by the competent authority to be equivalent to the knowledge standard of this Part. Such credits shall be established in accordance with Section B, Subpart E of this Part.

66.A.30 Experience requirements

(a) An applicant for an aircraft maintenance licence shall have acquired:

1. for category A and subcategories B1.2 and B1.4:
   (i) three years of practical maintenance experience on operating aircraft, if the applicant has no previous relevant technical training; or
   (ii) two years of practical maintenance experience on operating aircraft and completion of training considered relevant by the competent authority as a skilled worker, in a technical trade; or
   (iii) one year of practical maintenance experience on operating aircraft and completion of a Part-147 approved basic training course.
2. for category B2 and subcategories B1.1 and B1.3:
   (i) five years of practical maintenance experience on operating aircraft if the applicant has no previous relevant technical training; or
   (ii) three years of practical maintenance experience on operating aircraft and completion of training considered relevant by the competent authority as a skilled worker, in a technical trade; or
   (iii) two years of practical maintenance experience on operating aircraft and completion of a Part -147 approved basic training course.
3. for category C with respect to large aircraft:
   (i) three years of experience exercising category B1.1, B1.3 or B2 privileges on large aircraft or as Part-145 B1.1, B1.3 or B2 support staff, or, a combination of both; or
   (ii) five years of experience exercising category B1.2 or B1.4 privileges on large aircraft or as Part-145 B1.2 or B1.4 support staff, or a combination of both; or
4. for category C with respect to non large aircraft:

   three years of experience exercising category B1 or B.2 privileges on non large aircraft or as Part-145 B1 or B.2 support staff, or a combination of both; or
5. for category C obtained through the academic route:

   an applicant holding an academic degree in a technical discipline, from a university or other higher educational institution recognised by the competent authority, three years of experience working in a civil aircraft maintenance environment on a representative selection of tasks directly associated with aircraft maintenance including six months of observation of base maintenance tasks.

(b) An applicant for an extension to an aircraft maintenance licence shall have a minimum civil aircraft maintenance experience requirement appropriate to the additional category or subcategory of licence applied for as defined in Appendix IV to this Part.

(c) For category A, B1 and B2 the experience must be practical which means being involved with a representative cross section of maintenance tasks on aircraft.

(d) For all applicants, at least one year of the required experience must be recent maintenance experience on aircraft of the category/subcategory for which the initial aircraft maintenance licence is sought. For subsequent category/subcategory additions to an existing aircraft maintenance licence, the additional recent maintenance experience required may be less than one year, but must be at least three months. The required experience must be dependent upon the difference between the licence category/subcategory held and applied for. Such additional experience must be typical of the new licence category/subcategory sought.

(e) Notwithstanding paragraph (a), aircraft maintenance experience gained outside a civil aircraft maintenance environment shall be accepted when such maintenance is equivalent to that required by this Part as established by the competent authority. Additional experience of civil aircraft maintenance shall, however, be required to ensure understanding of the civil aircraft maintenance environment.

66.A.40 Continued validity of the aircraft maintenance licence

(a) The aircraft maintenance licence becomes invalid five years after its last issue or amendment, unless the holder submits his/her aircraft maintenance licence to the competent authority that issued it, in order to verify that the information contained in the licence is the same as that contained in the competent authority records, pursuant to 66. B.120.

(b) Any certification privileges based upon a aircraft maintenance licence becomes invalid as soon as the aircraft maintenance licence is invalid.

(c) The aircraft maintenance licence is only valid when issued and/or amended by the competent authority and when the holder has signed the document.

66.A.45 Type/task training and ratings

(a) The holder of a category A aircraft maintenance licence may only exercise certification privileges on a specific aircraft type following the satisfactory completion of the relevant category A aircraft task training carried out by an appropriately approved Part-145 or Part-147 organisation. The training shall include practical hands on training and theoretical training as appropriate for each task authorised. Satisfactory completion of training shall be demonstrated by an examination and/or by workplace assessment carried out by an appropriately approved Part-145 or Part-147 organisation.

(b) Except as otherwise specified in paragraph (g), the holder of a category B1, B2 or C aircraft maintenance licence shall only exercise certification privileges on a specific aircraft type when the aircraft maintenance licence is endorsed with the appropriate aircraft type rating.

(c) Except as otherwise specified in paragraph (h), ratings shall be granted following satisfactory completion of the relevant category B1, B2 or C aircraft type training approved by the competent authority or conducted by an appropriately approved Part-147 maintenance training organisation.

(d) Category B1 and B2 approved type training shall include theoretical and practical elements and consist of the appropriate course in relation to the 66.A.20(a) privileges. Theoretical and practical training shall comply with Appendix III to this Part.

(e) Category C approved type training shall comply with Appendix III to this Part. In the case of a category C person qualified by holding an academic degree as specified in 66.A.30(a), (5), the first relevant aircraft type theoretical training shall be at the category B1 or B2 level. Practical training is not required.

(f) Completion of approved aircraft type training, as required by paragraphs (b) to (e), shall be demonstrated by an examination. The examination shall comply with Appendix III to this Part. The examinations in respect of category B1 or B2 or C aircraft type ratings shall be conducted by training organisations appropriately approved under Part-147, the competent authority, or the training organisation conducting the approved type training course.

(g) Notwithstanding paragraph (b), for aircraft other than large aircraft, the holder of a category B1 or B2 aircraft maintenance licence may also exercise certification privileges, when the aircraft maintenance licence is endorsed with the appropriate group ratings, or manufacturer group ratings, unless the Agency has determined that the complexity of the aircraft in question requires a type rating.

1. Manufacturer group ratings may be granted after complying with the type rating requirements of two aircraft types representative of the group from the same manufacturer.

2. Full group ratings may be granted after complying with the type rating requirements of three aircraft types representative of the group from different manufacturers. However, no full group rating may be granted to B1 multiple turbine engine aeroplanes, where only manufacturer group rating applies.

3. The groups shall consist of the following:

(i) for category B1 or C:

— helicopter piston engine

— helicopter turbine engine

— aeroplane single piston engine — metal structure

— aeroplane multiple piston engines — metal structure

— aeroplane single piston engine — wooden structure

— aeroplane multiple piston engines — wooden structure

— aeroplane single piston engine — composite structure

— aeroplane multiple piston engines — composite structure

— aeroplane turbine — single engine

— aeroplane turbine — multiple engine

(ii) for category B2 or C:

— aeroplane

— helicopter

(h) Notwithstanding paragraph (c), ratings on aircraft other than large aircraft may also be granted, subject to satisfactory completion of the relevant category B1, B2 or C aircraft type examination and demonstration of practical experience on the aircraft type, unless the Agency has determined that the aircraft is complex, where paragraph 3 approved type training is required.

In the case of a category C ratings on aircraft other than large aircraft, for a person qualified by holding an academic degree as specified in 66.A.30 (a), (5), the first relevant aircraft type examination shall be at the category B1 or B2 level.

1. Category B1, B2 and C approved type examinations must consist of a mechanical examination for category B1 and an avionics examination for category B2 and both mechanical and avionics examination for category C.
2. The examination shall comply with Appendix III to this Part. The examination shall be conducted by training organisations appropriately approved under Part-147, or by the competent authority.
3. Aircraft type practical experience shall include a representative cross section of maintenance activities relevant to the category.

66.A.70 Conversion provisions

(a) The holder of a certifying staff qualification valid in a Member State, prior to the date of entry into force of this Part shall be issued an aircraft maintenance licence without further examination subject to the conditions specified in 66.B.300.

(b) A person undergoing a qualification process valid in a Member State, prior to the date of entry into force of this Part may continue to be qualified. The holder of a qualification gained following such qualification process shall be issued an aircraft maintenance licence without further examination subject to the conditions specified in 66.B.300

(c) Where necessary, the aircraft maintenance licence shall contain technical limitations in relation to the scope of the pre-existing qualification.

SUBPART B

AIRCRAFT OTHER THAN AEROPLANES AND HELICOPTERS

66.A.100 General

Until such time as this Part specifies a requirement for certifying staff of aircraft other than aeroplanes and helicopters, the relevant Member State regulation shall apply.

SUBPART C

COMPONENTS

66.A.200 General

Until such time as this Part specifies a requirement for certifying components, the relevant Member State regulation shall apply.

SECTION B

PROCEDURE FOR COMPETENT AUTHORITIES

SUBPART A

GENERAL

66.B.05 Scope

This section establishes the administrative requirements to be followed by the competent authorities in charge of the application and the enforcement of Section A of this Part.

66.B.10 Competent authority

(a) *General*

A Member State shall designate a competent authority with allocated responsibilities for the issuance, continuation, amendment, suspension or revocation of licences. This competent authority shall establish documented procedures and an organisational structure.

(b) *Resources*

The competent authority shall be appropriately staffed to carry out the requirements of this Part.

(c) *Procedures*

The competent authority shall establish procedures detailing how compliance with this Part is accomplished.

The procedures shall be reviewed and amended to ensure continued compliance.

66.B.15 Acceptable means of compliance

The Agency shall develop acceptable means of compliance that the Member States may use to establish compliance with this Part. When the acceptable means of compliance are complied with, the related requirements of this Part shall be considered as met.

66.B.20 Record-keeping

(a) The competent authority shall establish a system of record-keeping that allows adequate traceability of the process to issue, revalidate, amend, suspend or revoke each aircraft maintenance licence.

(b) The records for the oversight of the Part shall include:

1. the application for an aircraft maintenance licence or change to that licence, including all supporting documentation;
2. a copy of the aircraft maintenance licence including any changes;
3. copies of all relevant correspondence;
4. details of any exemption and enforcement actions;
5. any report from other competent authorities relating to the aircraft maintenance licence holder;
6. records of examinations conducted by the competent authority;
7. aircraft maintenance licence conversion reports;
8. examination credit reports.

(c) Records referred to in paragraph (b), 1. to 5. shall be kept at least five years after the end of the licence validity.

(d) Records referred to in paragraph (b), 6. shall be kept at least five years.

(e) Records referred to in paragraph (b), 7. and 8. shall be kept for an unlimited period.

66.B.25 Mutual exchange of information

(a) In order to contribute to the improvement of air safety, the competent authorities shall participate in a mutual exchange of all necessary information in accordance with Article 11 of the basic Regulation.

(b) Without prejudice to the competencies of the Member States, in the case of a potential safety threat involving several Member States, the concerned competent authorities shall assist each other in carrying out the necessary oversight action.

66.B.30 Exemptions

All exemptions granted in accordance with Article 10, 3. of the basic Regulation shall be recorded and retained by the competent authority.

SUBPART B

ISSUE OF AN AIRCRAFT MAINTENANCE LICENCE

This Subpart provides the procedures to be followed by the competent authority to issue or vary or to permit continuity of the aircraft maintenance licence.

66.B.100 Procedure for the issue of an aircraft maintenance licence by the competent authority

(a) On receipt of EASA Form 19 and any supporting documentation, the competent authority shall verify EASA Form 19 for completeness and ensure that the experience claimed meets the requirement of this Part.

(b) The competent authority shall verify an applicant's examination status and/or confirm the validity of any credits to ensure that all required modules of Appendix 1 have been met as required by this Part.

(c) When satisfied that the applicant meets the standards of knowledge and experience required by this Part, the competent authority shall issue the relevant aircraft maintenance licence to the applicant. The same information shall be kept on competent authority file.

66.B.105 Procedure for the issue of an aircraft maintenance licence via the Part-145 approved maintenance organisation

(a) A Part-145 maintenance organisation which has been authorised to carry out this activity by the competent authority may prepare the aircraft maintenance licence on behalf of the competent authority or make recommendations to the competent authority regarding the application from an individual for a aircraft maintenance licence so that the competent authority may prepare and issue such licence.

(b) The Part-145 maintenance organisation shall ensure compliance with 66.B.100 (a) and (b). In all cases, the competent authority shall issue the aircraft maintenance licence to the applicant.

66.B.110 Procedure for the amendment of an aircraft maintenance licence to include an additional basic category or subcategory

(a) In addition to the documents required under 66.B.100 or 66.B.105, as appropriate, the applicant for additional basic categories or subcategories to an aircraft maintenance licence shall submit his/her current original aircraft maintenance licence to the competent authority together with EASA Form 19.

(b) At the completion of the procedure as specified in 66.B.100 or 66.B.105, the competent authority shall endorse the additional basic category or subcategory on the aircraft maintenance licence by stamp and signature or reissue the licence. The competent authority file shall be amended accordingly.

(c) Where the applicant for amendment of the basic categories qualifies for such variation via 66.B.100 in a Member State other than the Member State in which he/she first qualified, the application shall be sent to the Member State of first qualification.

(d) Where the applicant for amendment of the basic categories qualifies for such variation via 66.B.105 in a Member State other than the Member State in which he/she first qualified, the Part-145 approved maintenance organisation shall send the aircraft maintenance licence together with EASA Form 19 to the Member State of first qualification for Member State stamp and signature of the amendment or reissue of the licence.

66.B.115 Procedure for the amendment of an aircraft maintenance licence to include an aircraft type or group

On receipt of a satisfactory EASA Form 19 and any supporting documentation demonstrating compliance with the applicable type rating and/or group rating requirements and the accompanying aircraft maintenance licence, the competent authority shall either endorse the applicant's aircraft maintenance licence with the aircraft type or group or reissue the said licence to include the aircraft type or group. The competent authority file shall be amended accordingly.

66.B.120 Procedure for the renewal of an aircraft maintenance licence validity

(a) The holder of an aircraft maintenance licence shall complete the relevant parts of EASA Form 19 and submit it with the holder's copy of the licence to the competent authority that issued the original aircraft maintenance licence, unless the Part-145 approved maintenance organisation has a procedure in its exposition whereby such organisation may submit the necessary documentation on behalf of the aircraft maintenance licence holder.

(b) The competent authority shall compare the holder's aircraft maintenance licence with the competent authority file and verify any pending revocation, suspension or variation action pursuant to 66.B.500. If the documents are identical and no action is pending pursuant to 66. B.500, the holder's copy shall be renewed for five years and the file endorsed accordingly.

(c) If the competent authority file is different from the aircraft maintenance licence held by the licence holder:

1. the competent authority shall investigate the reasons for such differences and may choose not to renew the aircraft maintenance licence.
2. the competent authority shall inform both the licence holder and any known Part-145 or Part-M approved maintenance organisation affected of such fact and shall, if necessary, take action under paragraph 66.B.155 to revoke, suspend or amend the licence in question.

SUBPART C

EXAMINATIONS

This Subpart provides the procedure for examinations conducted by the competent authority.

66.B.200 Examination by the competent authority

(a) All examination questions shall be kept in a secure manner prior to an examination, to ensure that candidates will not know which particular questions will form the basis of the examination. The competent authority shall nominate those persons who control the questions to be used for each examination.

(b) The competent authority shall appoint examiners who shall be present during all examinations to ensure the integrity of the examination.

(c) Basic examinations shall follow the standard specified in Appendix I and II to this Part.

(d) Type examinations must follow the standard specified in Appendix III to this Part.

(e) New essay questions shall be raised at least every six months and used questions withdrawn or rested from use. A record of the questions used shall be retained in the records for reference.

(f) All examination papers shall be handed out at the start of the examination to the candidate and handed back to the examiner at the end of the allotted examination time period. No examination paper may be removed from the examination room during the allotted examination time period.

(g) Apart from specific documentation needed for type examinations, only the examination paper may be available to the candidate during the examination.

(h) Examination candidates shall be separated from each other so that they cannot read each other's examination papers. They may not speak to any person other than the examiner.

(i) Candidates who are proven to be cheating shall be banned from taking any further examination within 12 months of the date of the examination in which they were found cheating.

SUBPART D

CONVERSION OF NATIONAL QUALIFICATIONS

This Subpart provides the requirements for converting national qualifications to aircraft maintenance licences.

66.B.300 General

(a) The competent authority may only perform the conversion specified in 66.A.70 in accordance with a conversion report prepared pursuant to paragraph 66.B.305 or 66.B.310, as applicable.

(b) The conversion report shall be either developed by the competent authority or approved by the competent authority.

66.B.305 Conversion report for national qualifications

The report shall describe the scope of each type of qualification and show to which aircraft maintenance licence it will be converted, which limitation will be added and the Part-66 module/subjects on which examination is needed to ensure conversion to the aircraft maintenance licence without limitation, or to include an additional (sub-) category. The report shall include a copy of the existing regulation defining the licence categories and scopes.

66.B.310 Conversion report for approved maintenance organisations authorisations

For each approved maintenance organisation concerned, the report shall describe the scope of each type of authorisation and show to which aircraft maintenance licence it will be converted, which limitation will be added and the module/subjects on which examination is needed to convert to the licence, or to include an additional (sub-)category. The report shall include a copy of the relevant approved maintenance organisation's procedures for the qualification of certifying staff, on which the conversion process is based.

SUBPART E

EXAMINATION CREDITS

This Subpart provides the requirements for granting examination credits in accordance with 66.A.25(b).

66.B.400 General

(a) The competent authority may only grant examination credit on the basis of an examination credit report prepared in accordance with 66.B.405.

(b) The examination credit report must be either developed by the competent authority or approved by the competent authority.

66.B.405 Examination credit report

(a) For each technical qualification concerned the report shall identify the subject matter and knowledge levels contained in Appendix I to this Part relevant to the particular category being compared.

(b) The report shall include a statement of compliance against each subject stating where, in the technical qualification, the equivalent standard can be found. If there is no equivalent standard for the particular subject, the report shall state such facts.

(c) Based upon paragraph (b) comparison, the report shall indicate for each technical qualification concerned the Appendix I subject matters subject to examination credits.

(d) Where the national qualification standard is changed, the report shall be amended as necessary.

SUBPART F

REVOCATION, SUSPENSION OR LIMITATION OF THE AIRCRAFT MAINTENANCE LICENCE

66.B.500 Revocation, suspension or limitation of the aircraft maintenance licence

The competent authority shall suspend, limit or revoke the aircraft maintenance licence where it has identified a safety issue or if it has clear evidence that the person has carried out or been involved in one or more of the following activities:

1. obtaining the aircraft maintenance licence and/or the certification privileges by falsification of submitted documentary evidence.
2. failing to carry out requested maintenance combined with failure to report such fact to the organisation or person who requested the maintenance.
3. failing to carry out required maintenance resulting from own inspection combined with failure to report such fact to the organisation or person for whom the maintenance was intended to be carried out.
4. negligent maintenance.
5. falsification of the maintenance record.
6. issuing a certificate of release to service knowing that the maintenance specified on the certificate of release to service has not been carried out or without verifying that such maintenance has been carried out.
7. carrying out maintenance or issuing a certificate of release to service when adversely affected by alcohol or drugs.
8. issuing certificate of release to service while not in compliance with this Part

Appendix I

Basic knowledge requirements

1. KNOWLEDGE LEVELS — CATEGORY A, B1, B2 AND C AIRCRAFT MAINTENANCE LICENCE

Basic knowledge for categories A, B1 and B2 are indicated by the allocation of knowledge levels indicators (1, 2 or 3) against each applicable subject. Category C applicants must meet either the category B1 or the category B2 basic knowledge levels.

The knowledge level indicators are defined as follows:

LEVEL 1

A familiarisation with the principal elements of the subject.

Objectives: The applicant should be familiar with the basic elements of the subject.

The applicant should be able to give a simple description of the whole subject, using common words and examples.

The applicant should be able to use typical terms.

LEVEL 2

A general knowledge of the theoretical and practical aspects of the subject.

An ability to apply that knowledge.

Objectives: The applicant should be able to understand the theoretical fundamentals of the subject.

The applicant should be able to give a general description of the subject using, as appropriate, typical examples.

The applicant should be able to use mathematical formulae in conjunction with physical laws describing the subject.

The applicant should be able to read and understand sketches, drawings and schematics describing the subject.

The applicant should be able to apply his knowledge in a practical manner using detailed procedures.

LEVEL 3

A detailed knowledge of the theoretical and practical aspects of the subject.

A capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

Objectives: The applicant should know the theory of the subject and interrelationships with other subjects.

The applicant should be able to give a detailed description of the subject using theoretical fundamentals and specific examples.

The applicant should understand and be able to use mathematical formulae related to the subject.

The applicant should be able to read, understand and prepare sketches, simple drawings and schematics describing the subject.

The applicant should be able to apply his knowledge in a practical manner using manufacturer's instructions.

The applicant should be able to interpret results from various sources and measurements and apply corrective action where appropriate.

2. MODULARISATION

Qualification on basic subjects for each Part-66 aircraft maintenance licence category or subcategory should be in accordance with the following matrix. Applicable subjects are indicated by an 'X':

Subject modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics
1	X	X	X	X	X
2	X	X	X	X	X
3	X	X	X	X	X
4	X	X	X	X	X

Subject modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics
5	X	X	X	X	X
6	X	X	X	X	X
7	X	X	X	X	X
8	X	X	X	X	X
9	X	X	X	X	X
10	X	X	X	X	X
11	X	X			
12			X	X	
13					X
14					X
15	X		X		
16		X		X	
17	X	X			

MODULE 1. MATHEMATICS

	Level		
	A	B1	B2
1.1 **Arithmetic**	1	2	2
Arithmetical terms and signs, methods of multiplication and division, fractions and decimals, factors and multiples, weights, measures and conversion factors, ratio and proportion, averages and percentages, areas and volumes, squares, cubes, square and cube roots.			
1.2 **Algebra**			
(a)	1	2	2
Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions;			
(b)	—	1	1
Linear equations and their solutions;			
Indices and powers, negative and fractional indices;			
Binary and other applicable numbering systems;			
Simultaneous equations and second degree equations with one unknown;			
logarithms;			
1.3 **Geometry**			
(a)	—	1	1
Simple geometrical constructions;			
(b)	2	2	2
Graphical representation; nature and uses of graphs, graphs of equations/functions;			
(c)	—	2	2
Simple trigonometry; trigonometrical relationships, use of tables and rectangular and polar coordinates.			

MODULE 2. PHYSICS

	Level		
	A	B1	B2
2.1 **Matter**	1	1	1
Nature of matter: the chemical elements, structure of atoms, molecules;			
Chemical compounds.			
States: solid, liquid and gaseous;			
Changes between states.			
2.2 **Mechanics**			
2.2.1 *Statics*	1	2	1
Forces, moments and couples, representation as vectors;			
Centre of gravity.			
Elements of theory of stress, strain and elasticity: tension, compression, shear and torsion;			

	Level		
	A	B1	B2
Nature and properties of solid, fluid and gas;			
Pressure and buoyancy in liquids (barometers).			
2.2.2 *Kinetics*	1	2	1
Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity);			
Rotational movement: uniform circular motion (centrifugal/centripetal forces);			
Periodic motion: pendular movement;			
Simple theory of vibration, harmonics and resonance;			
Velocity ratio, mechanical advantage and efficiency.			
2.2.3 *Dynamics*			
(a)	1	2	1
Mass			
Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;			
(b)	1	2	2
Momentum, conservation of momentum;			
Impulse;			
Gyroscopic principles;			
Friction: nature and effects, coefficient of friction (rolling resistance).			
2.2.4 *Fluid dynamics*			
(a)	2	2	2
Specific gravity and density;			
(b)	1	2	1
Viscosity, fluid resistance, effects of streamlining;			
effects of compressibility on fluids;			
Static, dynamic and total pressure: Bernoulli's Theorem, venturi.			
2.3 **Thermodynamics**			
(a)	2	2	2
Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin; Heat definition.			
(b)	—	2	2
Heat capacity, specific heat;			
Heat transfer: convection, radiation and conduction;			
Volumetric expansion;			
First and second law of thermodynamics;			

	Level		
	A	B1	B2
Gases: ideal gases laws; specific heat at constant volume and constant pressure, work done by expanding gas;			
Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps;			
Latent heats of fusion and evaporation, thermal energy, heat of combustion.			
2.4 **Optics (Light)**	—	2	2
Nature of light; speed of light;			
Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses;			
Fibre optics.			
2.5 **Wave Motion and Sound**	—	2	2
Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves;			
Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.			

MODULE 3. ELECTRICAL FUNDAMENTALS

	Level		
	A	B1	B2
3.1 **Electron Theory**	1	1	1
Structure and distribution of electrical charges within: atoms, molecules, ions, compounds;			
Molecular structure of conductors, semiconductors and insulators.			
3.2 **Static Electricity and Conduction**	1	2	2
Static electricity and distribution of electrostatic charges;			
Electrostatic laws of attraction and repulsion;			
Units of charge, Coulomb's Law;			
Conduction of electricity in solids, liquids, gases and a vacuum.			
3.3 **Electrical Terminology**	1	2	2
The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.			

	Level		
	A	B1	B2
3.4 **Generation of Electricity**	1	1	1
Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.			
3.5 **DC Sources of Electricity**	1	2	2
Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells;			
Cells connected in series and parallel;			
Internal resistance and its effect on a battery;			
Construction, materials and operation of thermocouples;			
Operation of photo-cells.			
3.6 **DC Circuits**	—	2	2
Ohms Law, Kirchoff's Voltage and Current Laws;			
Calculations using the above laws to find resistance, voltage and current;			
Significance of the internal resistance of a supply.			
3.7 **Resistance/Resistor**			
(a)	—	2	2
Resistance and affecting factors;			
Specific resistance;			
Resistor colour code, values and tolerances, preferred values, wattage ratings;			
Resistors in series and parallel;			
Calculation of total resistance using series, parallel and series parallel combinations;			
Operation and use of potentiometers and rheostats;			
Operation of Wheatstone Bridge.			
(b)	—	1	1
Positive and negative temperature coefficient conductance;			
Fixed resistors, stability, tolerance and limitations, methods of construction;			
Variable resistors, thermistors, voltage dependent resistors;			
Construction of potentiometers and rheostats;			
Construction of Wheatstone Bridge;			

	Level		
	A	B1	B2
3.8 **Power**	—	2	2
Power, work and energy (kinetic and potential);			
Dissipation of power by a resistor;			
Power formula;			
Calculations involving power, work and energy.			
3.9 **Capacitance/Capacitor**	—	2	2
Operation and function of a capacitor;			
Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating;			
Capacitor types, construction and function;			
Capacitor colour coding;			
Calculations of capacitance and voltage in series and parallel circuits;			
Exponential charge and discharge of a capacitor, time constants;			
Testing of capacitors.			
3.10 **Magnetism**			
(a)	—	2	2
Theory of magnetism;			
Properties of a magnet;			
Action of a magnet suspended in the Earth's magnetic field;			
Magnetisation and demagnetisation;			
Magnetic shielding;			
Various types of magnetic material;			
Electromagnets construction and principles of operation;			
Hand clasp rules to determine: magnetic field around current carrying conductor.			
(b)	—	2	2
Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents;			
Precautions for care and storage of magnets.			

	Level		
	A	B1	B2
3.11 **Inductance/Inductor**	—	2	2
Faraday's Law;			
Action of inducing a voltage in a conductor moving in a magnetic field;			
Induction principles;			
Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns;			
Mutual induction;			
The effect the rate of change of primary current and mutual inductance has on induced voltage;			
Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other;			
Lenz's Law and polarity determining rules;			
Back emf, self induction;			
Saturation point;			
Principle uses of inductors;			
3.12 **DC Motor/Generator Theory**	—	2	2
Basic motor and generator theory;			
Construction and purpose of components in DC generator;			
Operation of, and factors affecting output and direction of current flow in DC generators;			
Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors;			
Series wound, shunt wound and compound motors;			
Starter Generator construction.			
3.13 **AC Theory**	1	2	2
Sinusoidal waveform: phase, period, frequency, cycle;			
Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power			
Triangular/Square waves;			
Single/3 phase principles.			

	Level		
	A	B1	B2
3.14 **Resistive (R), Capacitive (C) and Inductive (L) Circuits**	—	2	2
Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel;			
Power dissipation in L, C and R circuits;			
Impedance, phase angle, power factor and current calculations;			
True power, apparent power and reactive power calculations.			
3.15 **Transformers**	—	2	2
Transformer construction principles and operation;			
Transformer losses and methods for overcoming them;			
Transformer action under load and no-load conditions;			
Power transfer, efficiency, polarity markings;			
Calculation of line and phase voltages and currents;			
Calculation of power in a three phase system;			
Primary and Secondary current, voltage, turns ratio, power, efficiency;			
Auto transformers.			
3.16 **Filters**	—	1	1
Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.			
3.17 **AC Generators**	—	2	2
Rotation of loop in a magnetic field and waveform produced;			
Operation and construction of revolving armature and revolving field type AC generators;			
Single phase, two phase and three phase alternators;			
Three phase star and delta connections advantages and uses;			
Permanent Magnet Generators.			
3.18 **AC Motors**	—	2	2
Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase;			
Methods of speed control and direction of rotation;			
Methods of producing a rotating field: capacitor, inductor, shaded or split pole.			

MODULE 4. ELECTRONIC FUNDAMENTALS

	Level		
	A	B1	B2
4.1 **Semiconductors**			
4.1.1 **Diodes**			
(a)	—	2	2
Diode symbols;			
Diode characteristics and properties;			
Diodes in series and parallel;			
Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes;			
Functional testing of diodes.			
(b)	—	—	2
Materials, electron configuration, electrical properties;			
P and N type materials: effects of impurities on conduction, majority and minority characters;			
PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions;			
Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation;			
Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers;			
Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Shottky diode, photo conductive diode, varactor diode, varistor, rectifier diodes, Zener diode.			
4.1.2 **Transistors**			
(a)	—	1	2
Transistor symbols;			
Component description and orientation;			
Transistor characteristics and properties.			
(b)	—	—	2
Construction and operation of PNP and NPN transistors;			
Base, collector and emitter configurations;			
Testing of transistors.			

	Level		
	A	B1	B2
Basic appreciation of other transistor types and their uses. Application of transistors: classes of amplifier (A, B, C); Simple circuits including: bias, decoupling, feedback and stabilisation; Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits.			
4.1.3 **Integrated Circuits**			
(a)	—	1	—
Description and operation of logic circuits and linear circuits/operational amplifiers.			
(b)	—	—	2
Description and operation of logic circuits and linear circuits; Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages and disadvantages of positive and negative feedback.			
4.2 **Printed Circuit Boards**	—	1	2
Description and use of printed circuit boards.			
4.3 **Servomechanisms**			
(a)	—	1	—
Understanding of the following terms: Open and closed loop systems, feedback, follow up, analogue transducers; Principles of operation and use of the following synchro system components/features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters.			
(b)	—	—	2
Understanding of the following terms: Open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, deadband; Construction operation and use of the following synchro system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Servomechanism defects, reversal of synchro leads, hunting.			

MODULE 5. DIGITAL TECHNIQUES ELECTRONIC INSTRUMENT SYSTEMS

	Level			
	A	B1.1 B1.3	B1.2 B1.4	B2
5.1 **Electronic Instrument Systems**	1	2	2	3
Typical systems arrangements and cockpit layout of electronic instrument systems.				
5.2 **Numbering Systems**	—	1	—	2
Numbering systems: binary, octal and hexadecimal;				
Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.				
5.3 **Data Conversion**	—	1	—	2
Analogue Data, Digital Data;				
Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.				
5.4 **Data Buses**	—	2	—	2
Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications.				
5.5 **Logic Circuits**				
(a)	—	2	—	2
Identification of common logic gate symbols, tables and equivalent circuits;				
Applications used for aircraft systems, schematic diagrams.				
(b)	—	—	—	2
Interpretation of logic diagrams.				
5.6 **Basic Computer Structure**				
(a)	1	2	—	—
Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM);				
Computer technology (as applied in aircraft systems).				
(b)	—	—	—	2
Computer related terminology;				
Operation, layout and interface of the major components in a micro computer including their associated bus systems;				
Information contained in single and multiaddress instruction words;				
Memory associated terms;				
Operation of typical memory devices;				
Operation, advantages and disadvantages of the various data storage systems.				

	Level			
	A	B1.1 B1.3	B1.2 B1.4	B2
5.7 **Microprocessors**	—	—	—	2
Functions performed and overall operation of a microprocessor;				
Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.				
5.8 **Integrated Circuits**	—	—	—	2
Operation and use of encoders and decoders;				
Function of encoder types;				
Uses of medium, large and very large scale integration.				
5.9 **Multiplexing**	—	—	—	2
Operation, application and identification in logic diagrams of multiplexers and demultiplexers.				
5.10 **Fibre Optics**	—	1	1	2
Advantages and disadvantages of fibre optic data transmission over electrical wire propagation;				
Fibre optic data bus;				
Fibre optic related terms;				
Terminations;				
Couplers, control terminals, remote terminals;				
Application of fibre optics in aircraft systems.				
5.11 **Electronic Displays**	—	2	—	2
Principles of operation of common types of displays used in modern aircraft, including				
Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display.				
5.12 **Electrostatic Sensitive Devices**	1	2	2	2
Special handling of components sensitive to electrostatic discharges;				
Awareness of risks and possible damage, component and personnel anti-static protection devices.				
5.13 **Software Management Control**	—	2	1	2
Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes.				

	Level			
	A	B1.1 B1.3	B1.2 B1.4	B2
5.14 **Electromagnetic Environment**	—	2	2	2
Influence of the following phenomena on maintenance practices for electronic system:				
EMC-Electromagnetic Compatibility				
EMI-Electromagnetic Interference				
HIRF-High Intensity Radiated Field				
Lightning/lightning protection				
5.15 **Typical Electronic/Digital Aircraft Systems**	—	2	2	2
General arrangement of typical electronic/digital aircraft systems and associated BITE				
(Built In Test Equipment) testing such as:				
ACARS-ARINC Communication and Addressing and Reporting System				
ECAM-Electronic Centralised Aircraft Monitoring				
EFIS-Electronic Flight Instrument System				
EICAS-Engine Indication and Crew Alerting System				
FBW-Fly by Wire				
FMS-Flight Management System				
GPS-Global Positioning System				
IRS-Inertial Reference System				
TCAS-Traffic Alert Collision Avoidance System				

MODULE 6. MATERIALS AND HARDWARE

	Level		
	A	B1	B2
6.1 **Aircraft Materials — Ferrous**			
(a)	1	2	1
Characteristics, properties and identification of common alloy steels used in aircraft;			
Heat treatment and application of alloy steels;			
(b)	—	1	1
Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.			
6.2 **Aircraft Materials — Non-Ferrous**			
(a)	1	2	1
Characteristics, properties and identification of common non-ferrous materials used in aircraft;			
Heat treatment and application of non-ferrous materials;			
(b)	—	1	1
Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.			
6.3 **Aircraft Materials — Composite and Non-Metallic**			
6.3.1 *Composite and non-metallic other than wood and fabric*			
(a)	1	2	2
Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft;			
Sealant and bonding agents.			
(b)	1	2	—
The detection of defects/deterioration in composite and non-metallic material.			
Repair of composite and non-metallic material.			
6.3.2 *Wooden structures*	1	2	—
Construction methods of wooden airframe structures;			
Characteristics, properties and types of wood and glue used in aeroplanes;			
Preservation and maintenance of wooden structure;			
Types of defects in wood material and wooden structures;			
The detection of defects in wooden structure;			
Repair of wooden structure.			

	Level		
	A	B1	B2
6.3.3 *Fabric covering*	1	2	—
Characteristics, properties and types of fabrics used in aeroplanes;			
Inspections methods for fabric;			
Types of defects in fabric;			
Repair of fabric covering.			
6.4 **Corrosion**			
(a)	1	1	1
Chemical fundamentals;			
Formation by, galvanic action process, microbiological, stress;			
(b)	2	3	2
Types of corrosion and their identification;			
Causes of corrosion;			
Material types, susceptibility to corrosion.			
6.5 **Fasteners**			
6.5.1 *Screw threads*	2	2	2
Screw nomenclature;			
Thread forms, dimensions and tolerances for standard threads used in aircraft;			
Measuring screw threads;			
6.5.2 *Bolts, studs and screws*	2	2	2
Bolt types: specification, identification and marking of aircraft bolts, international standards;			
Nuts: self locking, anchor, standard types;			
Machine screws: aircraft specifications;			
Studs: types and uses, insertion and removal;			
Self tapping screws, dowels.			
6.5.3 *Locking devices*	2	2	2
Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.			

	Level		
	A	B1	B2
6.5.4 *Aircraft rivets*	1	2	1
Types of solid and blind rivets: specifications and identification, heat treatment.			
6.6 **Pipes and Unions**			
(a)	2	2	2
Identification of, and types of rigid and flexible pipes and their connectors used in aircraft;			
(b)	2	2	1
Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.			
6.7 **Springs**	—	2	1
Types of springs, materials, characteristics and applications.			
6.8 **Bearings**	1	2	2
Purpose of bearings, loads, material, construction;			
Types of bearings and their application.			
6.9 **Transmissions**	1	2	2
Gear types and their application;			
Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns;			
Belts and pulleys, chains and sprockets.			
6.10 **Control Cables**	1	2	1
Types of cables;			
End fittings, turnbuckles and compensation devices;			
Pulleys and cable system components;			
Bowden cables;			
Aircraft flexible control systems.			
6.11 **Electrical Cables and Connectors**	1	2	2
Cable types, construction and characteristics;			
High tension and co-axial cables;			
Crimping;			
Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.			

MODULE 7. MAINTENANCE PRACTICES

	Level		
	A	B1	B2
7.1 **Safety Precautions-Aircraft and Workshop**	3	3	3
Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals.			
Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.			
7.2 **Workshop Practices**	3	3	3
Care of tools, control of tools, use of workshop materials;			
Dimensions, allowances and tolerances, standards of workmanship;			
Calibration of tools and equipment, calibration standards.			
7.3 **Tools**	3	3	3
Common hand tool types;			
Common power tool types;			
Operation and use of precision measuring tools;			
Lubrication equipment and methods.			
Operation, function and use of electrical general test equipment;			
7.4 **Avionic General Test Equipment**	—	2	3
Operation, function and use of avionic general test equipment.			
7.5 **Engineering Drawings, Diagrams and Standards**	1	2	2
Drawing types and diagrams, their symbols, dimensions, tolerances and projections;			
Identifying title block information;			
Microfilm, microfiche and computerised presentations;			
Specification 100 of the Air Transport Association (ATA) of America;			
Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL;			
Wiring diagrams and schematic diagrams.			

	Level		
	A	B1	B2
7.6 **Fits and Clearances**	1	2	1
Drill sizes for bolt holes, classes of fits;			
Common system of fits and clearances;			
Schedule of fits and clearances for aircraft and engines;			
Limits for bow, twist and wear;			
Standard methods for checking shafts, bearings and other parts.			
7.7 **Electrical Cables and Connectors**	1	2	2
Continuity, insulation and bonding techniques and testing;			
Use of crimp tools: hand and hydraulic operated;			
Testing of crimp joints;			
Connector pin removal and insertion;			
Co-axial cables: testing and installation precautions;			
Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding.			
7.8 **Riveting**	1	2	—
Riveted joints, rivet spacing and pitch;			
Tools used for riveting and dimpling;			
Inspection of riveted joints.			
7.9 **Pipes and Hoses**	1	2	—
Bending and belling/flaring aircraft pipes;			
Inspection and testing of aircraft pipes and hoses;			
Installation and clamping of pipes.			
7.10 **Springs**	1	2	—
Inspection and testing of springs.			
7.11 **Bearings**	1	2	—
Testing, cleaning and inspection of bearings;			
Lubrication requirements of bearings;			
Defects in bearings and their causes.			

	Level		
	A	B1	B2
7.12 **Transmissions**	1	2	—
Inspection of gears, backlash;			
Inspection of belts and pulleys, chains and sprockets;			
Inspection of screw jacks, lever devices, push-pull rod systems.			
7.13 **Control Cables**	1	2	—
Swaging of end fittings;			
Inspection and testing of control cables;			
Bowden cables; aircraft flexible control systems.			
7.14 **Material handling**			
7.14.1 *Sheet Metal*	—	2	—
Marking out and calculation of bend allowance;			
Sheet metal working, including bending and forming;			
Inspection of sheet metal work.			
7.14.2 *Composite and non-metallic*	—	2	—
Bonding practices;			
Environmental conditions			
Inspection methods			
7.15 **Welding, Brazing, Soldering and Bonding**			
(a)	—	2	2
Soldering methods; inspection of soldered joints.			
(b)	—	2	—
Welding and brazing methods;			
Inspection of welded and brazed joints;			
Bonding methods and inspection of bonded joints.			
7.16 **Aircraft Weight and Balance**			
(a)	—	2	2
Centre of Gravity/Balance limits calculation: use of relevant documents;			
(b)	—	2	—
Preparation of aircraft for weighing;			
Aircraft weighing;			

	Level		
	A	B1	B2
7.17 **Aircraft Handling and Storage**	2	2	2
Aircraft taxiing/towing and associated safety precautions;			
Aircraft jacking, chocking, securing and associated safety precautions;			
Aircraft storage methods;			
Refuelling/defuelling procedures;			
De-icing/anti-icing procedures;			
Electrical, hydraulic and pneumatic ground supplies.			
Effects of environmental conditions on aircraft handling and operation.			
7.18 **Disassembly, Inspection, Repair and Assembly Techniques**			
(a)	2	3	2
Types of defects and visual inspection techniques.			
Corrosion removal, assessment and reprotection.			
(b)	—	2	—
General repair methods, Structural Repair Manual;			
Ageing, fatigue and corrosion control programmes;			
(c)	—	2	1
Non destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods.			
(d)	2	2	2
Disassembly and re-assembly techniques.			
(e)	—	2	2
Trouble shooting techniques			
7.19 **Abnormal Events**			
(a)	2	2	2
Inspections following lightning strikes and HIRF penetration.			
(b)	2	2	—
Inspections following abnormal events such as heavy landings and flight through turbulence.			

	Level		
	A	B1	B2
7.20 **Maintenance Procedures**	1	2	2
Maintenance planning;			
Modification procedures;			
Stores procedures;			
Certification/release procedures;			
Interface with aircraft operation;			
Maintenance Inspection/Quality Control/Quality Assurance;			
Additional maintenance procedures.			
Control of life limited components			

MODULE 8. BASIC AERODYNAMICS

	Level		
	A	B1	B2
8.1 **Physics of the Atmosphere**	1	2	2
International Standard Atmosphere (ISA), application to aerodynamics.			
8.2 **Aerodynamics**	1	2	2
Airflow around a body;			
Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation;			
The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and wash out, fineness ratio, wing shape and aspect ratio;			
Thrust, Weight, Aerodynamic Resultant;			
Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall;			
Aerofoil contamination including ice, snow, frost.			

	Level		
	A	B1	B2
8.3 **Theory of Flight**	1	2	2
Relationship between lift, weight, thrust and drag;			
Glide ratio;			
Steady state flights, performance;			
Theory of the turn;			
Influence of load factor: stall, flight envelope and structural limitations;			
Lift augmentation.			
8.4 **Flight Stability and Dynamics**	1	2	2
Longitudinal, lateral and directional stability (active and passive).			

MODULE 9. HUMAN FACTORS

	Level		
	A	B1	B2
9.1 **General**	1	2	2
The need to take human factors into account;			
Incidents attributable to human factors/human error;			
'Murphy's' law.			
9.2 **Human Performance and Limitations**	1	2	2
Vision;			
Hearing;			
Information processing;			
Attention and perception;			
Memory;			
Claustrophobia and physical access.			
9.3 **Social Psychology**	1	1	1
Responsibility: individual and group;			
Motivation and de-motivation;			
Peer pressure;			
'Culture' issues;			
Team working;			
Management, supervision and leadership.			

	Level		
	A	B1	B2
9.4 **Factors Affecting Performance**	2	2	2
Fitness/health;			
Stress: domestic and work related;			
Time pressure and deadlines;			
Workload: overload and underload;			
Sleep and fatigue, shiftwork;			
Alcohol, medication, drug abuse.			
9.5 **Physical Environment**	1	1	1
Noise and fumes;			
Illumination;			
Climate and temperature;			
Motion and vibration;			
Working environment.			
9.6 **Tasks**	1	1	1
Physical work;			
Repetitive tasks;			
Visual inspection;			
Complex systems.			
9.7 **Communication**	2	2	2
Within and between teams;			
Work logging and recording;			
Keeping up to date, currency;			
Dissemination of information.			
9.8 **Human Error**	1	2	2
Error models and theories;			
Types of error in maintenance tasks;			
Implications of errors (i.e accidents)			
Avoiding and managing errors.			
9.9 **Hazards in the Workplace**	1	2	2
Recognising and avoiding hazards;			
Dealing with emergencies.			

	Level		
	A	B1	B2
10.7 **Applicable National and International Requirements for** (if not superseded by EU requirements)			
(a)	1	2	2
Maintenance Programmes, Maintenance checks and inspections;			
Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists;			
Airworthiness Directives;			
Service Bulletins, manufacturers service information;			
Modifications and repairs;			
Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.;			
(b)	—	1	1
Continuing airworthiness;			
Test flights;			
ETOPS, maintenance and dispatch requirements;			
All Weather Operations, Category 2/3 operations and minimum equipment requirements.			

MODULE 11A. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

	Level		
	A1	B1.1	B2
11.1 **Theory of Flight**			
11.1.1 *Aeroplane Aerodynamics and Flight Controls*	1	2	—
Operation and effect of: — roll control: ailerons and spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; — yaw control, rudder limiters;			
Control using elevons, ruddervators;			
High lift devices, slots, slats, flaps, flaperons;			

	Level		
	A1	B1.1	B2
Structure assembly techniques: riveting, bolting, bonding;			
Methods of surface protection, such as chromating, anodising, painting;			
Surface cleaning.			
Airframe symmetry: methods of alignment and symmetry checks.			
11.3 **Airframe Structures — Aeroplanes**			
11.3.1 *Fuselage (ATA 52/53/56)*			

	Level		
	A1	B1.1	B2
11.14 **Lights (ATA 33)**	2	3	—
External: navigation, anti-collision, landing, taxiing, ice;			
Internal: cabin, cockpit, cargo;			
Emergency.			
11.15 **Oxygen (ATA 35)**	1	3	—
System lay-out: cockpit, cabin;			
Sources, storage, charging and distribution;			
Supply regulation;			
Indications and warnings;			
11.16 **Pneumatic/Vacuum (ATA 36)**	1	3	—
System lay-out;			
Sources: engine/APU, compressors, reservoirs, ground supply;			
Pressure control;			
Distribution;			
Indications and warnings;			
Interfaces with other systems.			
11.17 **Water/Waste (ATA 38)**	2	3	—
Water system lay-out, supply, distribution, servicing and draining;			
Toilet system lay-out, flushing and servicing;			
Corrosion aspects.			
11.18 **On Board Maintenance Systems (ATA 45)**	1	2	—
Central maintenance computers;			
Data loading system;			
Electronic library system;			
Printing;			
Structure monitoring (damage tolerance monitoring).			

MODULE 11B. PISTON AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

Note: The scope of this Module should reflect the technology of aeroplanes pertinent to the A2 and B1.2 subcategory.

	Level		
	A2	B1.2	B2
11.1 **Theory of Flight**			
11.1.1 *Aeroplane Aerodynamics and Flight Controls*	1	2	—
Operation and effect of: — roll control: ailerons and spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; — yaw control, rudder limiters;			
Control using elevons, ruddervators;			
High lift devices, slots, slats, flaps, flaperons;			
Drag inducing devices, spoilers, lift dumpers, speed brakes;			
Effects of wing fences, saw tooth leading edges;			
Boundary layer control using, vortex generators, stall wedges or leading edge devices;			
Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels;			
11.1.2 *High Speed Flight — N/A*	—	—	—
11.2 **Airframe Structures — General Concepts**			
(a)	2	2	—
Airworthiness requirements for structural strength;			
Structural classification, primary, secondary and tertiary;			
Fail safe, safe life, damage tolerance concepts;			
Zonal and station identification systems;			
Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;			
Drains and ventilation provisions;			
System installation provisions;			
Lightning strike protection provision.			
Aircraft bonding			

	Level		
	A2	B1.2	B2
(b)	1	2	—
Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments;			
Structure assembly techniques: riveting, bolting, bonding;			
Methods of surface protection, such as chromating, anodising, painting;			
Surface cleaning;			
Airframe symmetry: methods of alignment and symmetry checks.			
11.3 **Airframe Structures — Aeroplanes**			
11.3.1 *Fuselage (ATA 52/53/56)*	1	2	—
Construction and pressurisation sealing;			
Wing, tail-plane pylon and undercarriage attachments;			
Seat installation;			
Doors and emergency exits: construction and operation;			
Window and windscreen attachment.			
11.3.2 *Wings (ATA 57)*	1	2	—
Construction;			
Fuel storage;			
Landing gear, pylon, control surface and high lift/drag attachments.			
11.3.3 *Stabilisers (ATA 55)*	1	2	—
Construction;			
Control surface attachment.			
11.3.4 *Flight Control Surfaces (ATA 55/57)*	1	2	—
Construction and attachment;			
Balancing — mass and aerodynamic.			
11.3.5 **Nacelles/Pylons (ATA 54)**			
(a)	1	2	—
Nacelles/Pylons: — Construction; — Firewalls; — Engine mounts.			

	Level		
	A2	B1.2	B2
11.4 **Air Conditioning and Cabin Pressurisation (ATA 21)**	1	3	—
Pressurisation and air conditioning systems;			
Cabin pressure controllers, protection and warning devices.			
11.5 **Instruments/Avionic Systems**			
11.5.1 *Instrument Systems (ATA 31)*	1	2	—
Pitot static: altimeter, air speed indicator, vertical speed indicator;			
Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;			
Compasses: direct reading, remote reading;			
Angle of attack indication, stall warning systems.			
Other aircraft system indication.			
11.5.2 *Avionic Systems*	1	1	—
Fundamentals of system lay-outs and operation of: — Auto Flight (ATA 22); — Communications (ATA 23); — Navigation Systems (ATA 34).			
11.6 **Electrical Power (ATA 24)**	1	3	—
Batteries Installation and Operation;			
DC power generation;			
Voltage regulation;			
Power distribution;			
Circuit protection;			
Inverters, transformers.			
11.7 **Equipment and Furnishings (ATA 25)**			
(a)	2	2	—
Emergency equipment requirements;			
Seats, harnesses and belts.			
(b)	1	1	—
Cabin lay-out;			
Equipment lay-out;			
Cabin Furnishing Installation (level 2);			
Cabin entertainment equipment;			
Galley installation;			
Cargo handling and retention equipment;			
Airstairs.			

	Level		
	A2	B1.2	B2
11.8 **Fire Protection (ATA 26)**			
(a)	1	3	—
Fire extinguishing systems;			
Fire and smoke detection and warning systems;			
System tests.			
(b)	1	3	—
Portable fire extinguisher.			
11.9 **Flight Controls (ATA 27)**	1	3	—
Primary controls: aileron, elevator, rudder;			
Trim tabs;			
High lift devices;			
System operation: manual;			
Gust locks;			
Balancing and rigging;			
Stall warning system.			
11.10 **Fuel Systems (ATA 28)**	1	3	—
System lay-out;			
Fuel tanks;			
Supply systems;			
Cross-feed and transfer;			
Indications and warnings;			
Refuelling and defuelling.			
11.11 **Hydraulic Power (ATA 29)**	1	3	—
System lay-out;			
Hydraulic fluids;			
Hydraulic reservoirs and accumulators;			
Pressure generation: electric, mechanical;			
Pressure Control;			
Power distribution;			
Indication and warning systems.			

	Level		
	A2	B1.2	B2
11.12 **Ice and Rain Protection (ATA 30)**	1	3	—
Ice formation, classification and detection;			
De-icing systems: electrical, hot air, pneumatic and chemical;			
Probe and drain heating;			
Wiper systems.			
11.13 **Landing Gear (ATA 32)**	2	3	—
Construction, shock absorbing;			
Extension and retraction systems: normal and emergency;			
Indications and warning;			
Wheels, brakes, antiskid and autobraking;			
Tyres;			
Steering.			
11.14 **Lights (ATA 33)**	2	2	—
External: navigation, anti collision, landing, taxiing, ice;			
Internal: cabin, cockpit, cargo;			
Emergency.			
11.15 **Oxygen (ATA 35)**	1	3	—
System lay-out: cockpit, cabin;			
Sources, storage, charging and distribution;			
Supply regulation;			
Indications and warnings;			
11.16 **Pneumatic/Vacuum (ATA 36)**	1	3	—
System lay-out;			
Sources: engine/APU, compressors, reservoirs, ground supply;			
Pressure control;			
Distribution;			
Indications and warnings;			
Interfaces with other systems.			

	Level		
	A2	B1.2	B2
11.17 **Water/Waste (ATA 38)**	2	3	—
Water system lay-out, supply, distribution, servicing and draining;			
Toilet system lay-out, flushing and servicing;			
Corrosion aspects.			

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

	Level		
	A3 A4	B1.3 B1.4	B2
12.1 **Theory of Flight — Rotary Wing Aerodynamics**	1	2	—
Terminology;			
Effects of gyroscopic precession;			
Torque reaction and directional control;			
Dissymmetry of lift, Blade tip stall;			
Translating tendency and its correction;			
Coriolis effect and compensation;			
Vortex ring state, power settling, overpitching;			
Auto-rotation;			
Ground effect.			
12.2 **Flight Control Systems**	2	3	—
Cyclic control;			
Collective control;			
Swashplate;			
Yaw control: Anti-Torque Control, Tail rotor, bleed air;			
Main Rotor Head: Design and Operation features;			
Blade Dampers: Function and construction;			
Rotor Blades: Main and tail rotor blade construction and attachment;			
Trim control, fixed and adjustable stabilisers;			
System operation: manual, hydraulic, electrical and fly-by-wire;			
Artificial feel;			
Balancing and Rigging.			

	Level		
	A3 A4	B1.3 B1.4	B2
12.3 **Blade Tracking and Vibration Analysis**	1	3	—
Rotor alignment;			
Main and tail rotor tracking;			
Static and dynamic balancing;			
Vibration types, vibration reduction methods;			
Ground resonance.			
12.4 **Transmissions**	1	3	—
Gear boxes, main and tail rotors;			
Clutches, free wheel units and rotor brake.			
12.5 **Airframe Structures**			
(a)	2	2	—
Airworthiness requirements for structural strength;			
Structural classification, primary, secondary and tertiary;			
Fail safe, safe life, damage tolerance concepts;			
Zonal and station identification systems;			
Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;			
Drains and ventilation provisions;			
System installation provisions;			
Lightning strike protection provision.			
(b)	1	2	—
Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning and anti-corrosive protection.			
Pylon, stabiliser and undercarriage attachments;			
Seat installation;			
Doors: construction, mechanisms, operation and safety devices;			
Windows and windscreen construction;			
Fuel storage;			
Firewalls;			
Engine mounts;			
Structure assembly techniques: riveting, bolting, bonding;			

	Level		
	A3 A4	B1.3 B1.4	B2
Methods of surface protection, such as chromating, anodising, painting;			
Surface cleaning.			
Airframe symmetry: methods of alignment and symmetry checks.			
12.6 **Air Conditioning (ATA 21)**			
12.6.1 *Air supply*	1	2	—
Sources of air supply including engine bleed and ground cart;			
12.6.2 *Air Conditioning*	1	3	—
Air conditioning systems;			
Distribution systems;			
Flow and temperature control systems;			
Protection and warning devices.			
12.7 **Instruments/Avionic Systems**			
12.7.1 *Instrument Systems (ATA 31)*	1	2	—
Pitot static:altimeter, air speed indicator, vertical speed indicator;			
Gyroscopic:artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;			
Compasses: direct reading, remote reading;			
Vibration indicating systems — HUMS;			
Other aircraft system indication.			
12.7.2 *Avionic Systems*	1	1	—
Fundamentals of system layouts and operation of:			
Auto Flight (ATA 22);			
Communications (ATA 23);			
Navigation Systems (ATA 34).			
12.8 **Electrical Power (ATA 24)**	1	3	—
Batteries Installation and Operation;			
DC power generation, AC power generation;			
Emergency power generation;			
Voltage regulation, Circuit protection.			
Power distribution;			
Inverters, transformers, rectifiers;			
External/Ground power.			
12.9 **Equipment and Furnishings (ATA 25)**			
(a)	2	2	—
Emergency equipment requirements;			

	Level		
	A3 A4	B1.3 B1.4	B2
Seats, harnesses and belts;			
Lifting systems.			
(b)	1	1	—
Emergency flotation systems;			
Cabin lay-out, cargo retention;			
Equipment lay-out;			
Cabin Furnishing Installation.			
12.10 **Fire Protection (ATA 26)**	1	3	—
Fire and smoke detection and warning systems;			
Fire extinguishing systems;			
System tests.			
12.11 **Fuel Systems (ATA 28)**	1	3	—
System lay-out;			
Fuel tanks;			
Supply systems;			
Dumping, venting and draining;			
Cross-feed and transfer;			
Indications and warnings;			
Refuelling and defuelling.			
12.12 **Hydraulic Power (ATA 29)**	1	3	—
System lay-out;			
Hydraulic fluids;			
Hydraulic reservoirs and accumulators;			
Pressure generation: electric, mechanical, pneumatic;			
Emergency pressure generation;			
Pressure Control;			
Power distribution;			
Indication and warning systems;			
Interface with other systems.			

	Level		
	A3 A4	B1.3 B1.4	B2
12.13 **Ice and Rain Protection (ATA 30)**	1	3	—
Ice formation, classification and detection;			
Anti-icing and de-icing systems: electrical, hot air and chemical;			
Rain repellant and removal;			
Probe and drain heating.			
12.14 **Landing Gear (ATA 32)**	2	3	—
Construction, shock absorbing;			
Extension and retraction systems: normal and emergency;			
Indications and warning;			
Wheels, tyres, brakes;			
Steering;			
Skids, floats.			
12.15 **Lights (ATA 33)**	2	3	—
External: navigation, landing, taxiing, ice;			
Internal: cabin, cockpit, cargo;			
Emergency.			
12.16 **Pneumatic/Vacuum (ATA 36)**	1	3	—
System lay-out;			
Sources: engine, compressors, reservoirs, ground supply.;			
Pressure control;			
Distribution;			
Indications and warnings;			
Interfaces with other systems.			

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

	Level		
	A	B1	B2
13.1 **Theory of Flight**			
(a) *Aeroplane Aerodynamics and Flight Controls*	—	—	1
Operation and effect of: — roll control: ailerons and spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; — yaw control, rudder limiters;			

	Level		
	A	B1	B2
Control using elevons, ruddervators;			
High lift devices: slots, slats, flaps;			
Drag inducing devices: spoilers, lift dumpers, speed brakes;			
Operation and effect of trim tabs, servo tabs, control surface bias.			
(b) *High Speed Flight*	—	—	1
Speed of sound, subsonic flight, transonic flight, supersonic flight,			
Mach number, critical Mach number.			
(c) *Rotary Wing Aerodynamics*	—	—	1
Terminology;			
Operation and effect of cyclic, collective and anti-torque controls.			
13.2 **Structures — General Concepts**			
(a)	—	—	1
Fundamentals of structural systems.			
(b)	—	—	2
Zonal and station identification systems;			
Electrical bonding;			
Lightning strike protection provision.			
13.3 **Autoflight (ATA 22)**	—	—	3
Fundamentals of automatic flight control including working principles and current terminology;			
Command signal processing;			
Modes of operation: roll, pitch and yaw channels;			
Yaw dampers;			
Stability Augmentation System in helicopters;			
Automatic trim control;			

	Level		
	A	B1	B2
Autopilot navigation aids interface;			
Autothrottle systems.			
Automatic Landing Systems: principles and categories, modes of operation, approach, glideslope, land, go-around, system monitors and failure conditions.			
13.4 **Communication/Navigation (ATA 23/34)**	—	—	3
Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter;			
Working principles of following systems: — Very High Frequency (VHF) communication; — High Frequency (HF) communication; — Audio; — Emergency Locator Transmitters; — Cockpit Voice Recorder; — Very High Frequency omnidirectional range (VOR); — Automatic Direction Finding (ADF); — Instrument Landing System (ILS); — Microwave Landing System (MLS); — Flight Director systems; Distance Measuring Equipment (DME); — Very Low Frequency and hyperbolic navigation (VLF/Omega); — Doppler navigation; — Area navigation, RNAV systems; — Flight Management Systems; — Global Positioning System (GPS), Global Navigation Satellite Systems (GNSS); — Inertial Navigation System; — Air Traffic Control transponder, secondary surveillance radar; — Traffic Alert and Collision Avoidance System (TCAS); — Weather avoidance radar; — Radio altimeter; — ARINC communication and reporting;			
13.5 **Electrical Power (ATA 24)**	—	—	3
Batteries Installation and Operation;			
DC power generation;			
AC power generation;			
Emergency power generation;			

	Level		
	A	B1	B2
Voltage regulation;			
Power distribution;			
Inverters, transformers, rectifiers;			
Circuit protection;			
External/Ground power.			
13.6 **Equipment and Furnishings (ATA 25)**	—	—	3
Electronic emergency equipment requirements;			
Cabin entertainment equipment.			
Flight Controls (ATA 27)			
(a)	—	—	1
Primary controls: aileron, elevator, rudder, spoiler;			
Trim control;			
Active load control;			
High lift devices;			
Lift dump, speed brakes;			
System operation: manual, hydraulic, pneumatic;			
Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks.			
Stall protection systems.			
(b)	—	—	2
System operation: electrical, fly by wire.			
13.8 **Instrument Systems (ATA 31)**	—	—	2
Classification;			
Atmosphere;			
Terminology;			
Pressure measuring devices and systems;			
Pitot static systems;			
Altimeters;			
Vertical speed indicators;			
Airspeed indicators;			
Machmeters;			
Altitude reporting/alerting systems;			
Air data computers;			
Instrument pneumatic systems;			
Direct reading pressure and temperature gauges;			
Temperature indicating systems;			
Fuel quantity indicating systems;			

	Level		
	A	B1	B2
Gyroscopic principles;			
Artificial horizons;			
Slip indicators;			
Directional gyros;			
Ground Proximity Warning Systems;			
Compass systems;			
Flight Data Recording systems;			
Electronic Flight Instrument Systems;			
Instrument warning systems including master warning systems and centralised warning panels;			
Stall warning systems and angle of attack indicating systems;			
Vibration measurement and indication.			
13.9 **Lights (ATA 33)**	—	—	3
External: navigation, landing, taxiing, ice;			
Internal: cabin, cockpit, cargo;			
Emergency.			
13.10 **On board Maintenance Systems (ATA 45)**	—	—	2
Central maintenance computers;			
Data loading system;			
Electronic library system;			
Printing;			
Structure monitoring (damage tolerance monitoring).			

MODULE 14 PROPULSION

	Level		
	A	B1	B2
14.1 **Turbine Engines**			
(a)	—	—	1
Constructional arrangement and operation of turbojet, turbofan, turboshaft and turbopropeller engines;			
(b)	—	—	2
Electronic Engine control and fuel metering systems (FADEC).			

	Level		
	A	B1	B2
14.2 **Engine Indicating Systems**	—	—	2
Exhaust gas temperature/Interstage turbine temperature systems;			
Engine speed;			
Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems;			
Oil pressure and temperature;			
Fuel pressure, temperature and flow;			
Manifold pressure;			
Engine torque;			
Propeller speed.			

MODULE 15. GAS TURBINE ENGINE

	Level		
	A	B1	B2
15.1 **Fundamentals**	1	2	—
Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle;			
The relationship between force, work, power, energy, velocity, acceleration;			
Constructional arrangement and operation of turbojet, turbofan, turboshaft, turboprop.			
15.2 **Engine Performance**	—	2	—
Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption;			
Engine efficiencies;			
By-pass ratio and engine pressure ratio;			
Pressure, temperature and velocity of the gas flow;			
Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.			

	Level		
	A	B1	B2
15.3 **Inlet**	2	2	—
Compressor inlet ducts			
Effects of various inlet configurations;			
Ice protection.			
15.4 **Compressors**	1	2	—
Axial and centrifugal types;			
Constructional features and operating principles and applications;			
Fan balancing;			
Operation:			
Causes and effects of compressor stall and surge;			
Methods of air flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades;			
Compressor ratio.			
15.5 **Combustion Section**	1	2	—
Constructional features and principles of operation.			
15.6 **Turbine Section**	2	2	—
Operation and characteristics of different turbine blade types;			
Blade to disk attachment;			
Nozzle guide vanes;			
Causes and effects of turbine blade stress and creep.			
15.7 **Exhaust**	1	2	—
Constructional features and principles of operation;			
Convergent, divergent and variable area nozzles;			
Engine noise reduction;			
Thrust reversers.			
15.8 **Bearings and Seals**	—	2	—
Constructional features and principles of operation.			
15.9 **Lubricants and Fuels**	1	2	—
Properties and specifications;			
Fuel additives;			
Safety precautions.			

	Level		
	A	B1	B2
15.10 **Lubrication Systems**	1	2	—
System operation/lay-out and components.			
15.11 **Fuel Systems**	1	2	—
Operation of engine control and fuel metering systems including electronic engine control (FADEC);			
Systems lay-out and components.			
15.12 **Air Systems**	1	2	—
Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air services.			
15.13 **Starting and Ignition Systems**	1	2	—
Operation of engine start systems and components;			
Ignition systems and components;			
Maintenance safety requirements.			
15.14 **Engine Indication Systems**	1	2	—
Exhaust Gas Temperature/Interstage Turbine Temperature;			
Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems;			
Oil pressure and temperature;			
Fuel pressure and flow;			
Engine speed;			
Vibration measurement and indication;			
Torque;			
Power.			
15.15 **Power Augmentation Systems**	—	1	—
Operation and applications;			
Water injection, water methanol;			
Afterburner systems.			
15.16 **Turbo-prop Engines**	1	2	—
Gas coupled/free turbine and gear coupled turbines;			
Reduction gears;			
Integrated engine and propeller controls;			
Overspeed safety devices.			

	Level		
	A	B1	B2
15.17 **Turbo-shaft engines**	1	2	—
Arrangements, drive systems, reduction gearing, couplings, control systems.			
15.18 **Auxiliary Power Units (APUs)**	1	2	—
Purpose, operation, protective systems.			
15.19 **Powerplant Installation**	1	2	—
Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.			
15.20 **Fire Protection Systems**	1	2	—
Operation of detection and extinguishing systems.			
15.21 **Engine Monitoring and Ground Operation**	1	3	—
Procedures for starting and ground run-up;			
Interpretation of engine power output and parameters;			
Trend (including oil analysis, vibration and boroscope) monitoring;			
Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer;			
Compressor washing/cleaning;			
Foreign Object Damage.			
15.22 **Engine Storage and Preservation**	—	2	—
Preservation and depreservation for the engine and accessories/systems.			

MODULE 16. PISTON ENGINE

	Level		
	A	B1	B2
16.1 **Fundamentals**	1	2	—
Mechanical, thermal and volumetric efficiencies;			
Operating principles — 2 stroke, 4 stroke, Otto and Diesel;			
Piston displacement and compression ratio;			
Engine configuration and firing order.			
16.2 **Engine Performance**	1	2	—
Power calculation and measurement;			
Factors affecting engine power;			
Mixtures/leaning, pre-ignition.			

	Level		
	A	B1	B2
16.3 **Engine Construction**	1	2	—
Crank case, crank shaft, cam shafts, sumps;			
Accessory gearbox;			
Cylinder and piston assemblies;			
Connecting rods, inlet and exhaust manifolds;			
Valve mechanisms;			
Propeller reduction gearboxes.			
16.4 **Engine Fuel Systems**			
16.4.1 *Carburettors*	1	2	—
Types, construction and principles of operation;			
Icing and heating.			
16.4.2 *Fuel injection systems*	1	2	—
Types, construction and principles of operation.			
16.4.3 *Electronic engine control*	1	2	—
Operation of engine control and fuel metering systems including electronic engine control (FADEC);			
Systems lay-out and components.			
16.5 **Starting and Ignition Systems**	1	2	—
Starting systems, pre-heat systems;			
Magneto types, construction and principles of operation;			
Ignition harnesses, spark plugs;			
Low and high tension systems.			
16.6 **Induction, Exhaust and Cooling Systems**	1	2	—
Construction and operation of: induction systems including alternate air systems;			
Exhaust systems, engine cooling systems — air and liquid.			
16.7 **Supercharging/Turbocharging**	1	2	—
Principles and purpose of supercharging and its effects on engine parameters;			
Construction and operation of supercharging/turbocharging systems;			
System terminology;			
Control systems;			
System protection.			

	Level		
	A	B1	B2
16.8 **Lubricants and Fuels**	1	2	—
Properties and specifications;			
Fuel additives;			
Safety precautions.			
16.9 **Lubrication Systems**	1	2	—
System operation/lay-out and components.			
16.10 **Engine Indication Systems**	1	2	—
Engine speed;			
Cylinder head temperature;			
Coolant temperature;			
Oil pressure and temperature;			
Exhaust Gas Temperature;			
Fuel pressure and flow;			
Manifold pressure.			
16.11 **Powerplant Installation**	1	2	—
Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.			
16.12 **Engine Monitoring and Ground Operation**	1	3	—
Procedures for starting and ground run-up;			
Interpretation of engine power output and parameters;			
Inspection of engine and components: criteria, tolerances, and data specified by engine manufacturer.			
16.13 **Engine Storage and Preservation**	—	2	—
Preservation and depreservation for the engine and accessories/systems.			

MODULE 17. PROPELLER

	Level		
	A	B1	B2
17.1 **Fundamentals**	1	2	—
Blade element theory;			
High/low blade angle, reverse angle, angle of attack, rotational speed;			
Propeller slip;			
Aerodynamic, centrifugal, and thrust forces;			
Torque;			
Relative airflow on blade angle of attack;			
Vibration and resonance.			

	Level		
	A	B1	B2
17.2 **Propeller Construction**	1	2	—
Construction methods and materials used in wooden, composite and metal propellers;			
Blade station, blade face, blade shank, blade back and hub assembly;			
Fixed pitch, controllable pitch, constant speeding propeller;			
Propeller/spinner installation.			
17.3 **Propeller Pitch Control**	1	2	—
Speed control and pitch change methods, mechanical and electrical/electronic;			
Feathering and reverse pitch;			
Overspeed protection.			
17.4 **Propeller Synchronising**	—	2	—
Synchronising and synchrophasing equipment.			
17.5 **Propeller Ice Protection**	1	2	—
Fluid and electrical de-icing equipment.			
17.6 **Propeller Maintenance**	1	3	—
Static and dynamic balancing;			
Blade tracking;			
Assessment of blade damage, erosion, corrosion, impact damage, delamination;			
Propeller treatment/repair schemes;			
Propeller engine running.			
17.7 **Propeller Storage and Preservation**	1	2	—
Propeller preservation and depreservation			

Appendix II

Basic Examination Standard

1. *Standardisation Basis For Examinations*

1.1. All basic examinations must be carried out using the multi-choice question format and essay questions as specified below.

1.2. Each multi-choice question must have three alternative answers of which only one must be the correct answer and the candidate must be allowed a time per module which is based upon a nominal average of 75 seconds per question.

1.3. Each essay question requires the preparation of a written answer and the candidate must be allowed 20 minutes to answer each such question.

1.4. Suitable essay questions must be drafted and evaluated using the knowledge syllabus in Part-66 Appendix I Modules 7, 9 and 10.

1.5. Each question will have a model answer drafted for it, which will also include any known alternative answers that may be relevant for other subdivisions.

1.6. The model answer will also be broken down into a list of the important points known as Key Points.

1.7. The pass mark for each Part-66 module and sub-module multi-choice part of the examination is 75 %.

1.8. The pass mark for each essay question is 75 % in that the candidates answer must contain 75 % of the required key points addressed by the question and no significant error related to any required key point.

1.9. If either the multi-choice part only or the essay part only is failed, then it is only necessary to retake the multi-choice or essay part, as appropriate.

1.10. Penalty marking systems must not be used to determine whether a candidate has passed.

1.11. All Part-66 modules that make up a complete Part-66 aircraft maintenance licence category or subcategory must be passed within a 5 year time period of passing the first module except in the case specified in paragraph 1.12. A failed module may not be retaken for at least 90 days following the date of the failed module examination, except in the case of a Part-147 approved maintenance training organisation which conducts a course of retraining tailored to the failed subjects in the particular module when the failed module may be retaken after 30 days.

1.12. The 5 year time period specified in paragraph 1.11 does not apply to those modules which are common to more than one Part-66 aircraft maintenance licence category or subcategory and which were previously passed as part of another such category or subcategory examination.

2. *Question Numbers for the Part-66 Appendix I Modules*

2.1. Subject Module 1 Mathematics:

Category A-16 multi-choice and 0 essay questions. Time allowed 20 minutes.

Category B1-30 multi-choice and 0 essay questions. Time allowed 40 minutes.

Category B2-30 multi-choice and 0 essay questions. Time allowed 40 minutes.

2.2. Subject Module 2 Physics:

Category A-30 multi-choice and 0 essay questions. Time allowed 40 minutes.

Category B1-50 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B2-50 multi-choice and 0 essay questions. Time allowed 65 minutes.

2.3. Subject Module 3 Electrical Fundamentals:

Category A- 0 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B1-50 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B2-50 multi-choice and 0 essay questions. Time allowed 65 minutes.

2.4. Subject Module 4 Electronic Fundamentals:

Category A-None.

Category B1-20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B2-40 multi-choice and 0 essay questions. Time allowed 50 minutes.

2.5. Subject Module 5 Digital Techniques/Electronic Instrument Systems:

Category A-16 multi-choice and 0 essay questions. Time allowed 20 minutes.

Category B1.1 & B1.3-40 multi-choice and 0 essay questions. Time allowed 50 minutes.

Category B1.2 & B1.4-20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B2-70 multi-choice and 0 essay questions. Time allowed 90 minutes.

2.6. Subject Module 6 Materials and Hardware:

Category A-50 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B1-70 multi-choice and 0 essay questions. Time allowed 90 minutes.

Category B2-60 multi-choice and 0 essay questions. Time allowed 75 minutes.

2.7. Subject Module 7 Maintenance Practices:

Category A-70 multi-choice and 2 essay questions. Time allowed 90 minutes plus 40 minutes.

Category B1-80 multi-choice and 2 essay questions. Time allowed 100 minutes plus 40 minutes.

Category B2-60 multi-choice and 2 essay questions. Time allowed 75 minutes plus 40 minutes.

2.8. Subject Module 8 Basic Aerodynamics:

Category A-20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B1-20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B2-20 multi-choice and 0 essay questions. Time allowed 25 minutes.

2.9. Subject Module 9 Human factors:

Category A-20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.

Category B1-20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.

Category B2-20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.

2.10. Subject Module 10 Aviation Legislation:

Category A-30 multi-choice and 1 essay question. Time allowed 40 minutes plus 20 minutes.

Category B1-40 multi-choice and 1 essay question. Time allowed 50 minutes plus 20 minutes.

Category B2-40 multi-choice and 1 essay question. Time allowed 50 minutes plus 20 minutes.

2.11. Subject Module 11a Turbine Aeroplane Aerodynamics, Structures and Systems:

Category A-100 multi-choice and 0 essay questions. Time allowed 125 minutes.

Category B1-130 multi-choice and 0 essay questions. Time allowed 165 minutes.

Category B2-None.

2.12. Subject Module 11b Piston Aeroplane Aerodynamics, Structures and Systems:

Category A-70 multi-choice and 0 essay questions. Time allowed 90 minutes.

Category B1-100 multi-choice and 0 essay questions. Time allowed 125 minutes.

Category B2-None.

2.13. Subject Module 12 Helicopter Aerodynamics, Structures and Systems:

Category A-90 multi-choice and 0 essay questions. Time allowed 115 minutes.

Category B1-115 multi-choice and 0 essay questions. Time allowed 145 minutes.

Category B2-None.

2.14. Subject Module 13 Aircraft Aerodynamics, Structures and Systems:

Category A-None.

Category B1-None.

Category B2-130 multi-choice and 0 essay questions. Time allowed 165 minutes.

2.15. Subject Module 14 Propulsion:

Category A-None.

Category B1-None.

Category B2-25 multi-choice and 0 essay questions. Time allowed 30 minutes.

2.16. Subject Module 15 Gas Turbine Engine:

Category A-60 multi-choice and 0 essay questions. Time allowed 75 minutes.

Category B1-90 multi-choice and 0 essay questions. Time allowed 115 minutes.

Category B2-None.

2.17. Subject Module 16 Piston Engine:

Category A-0 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B1-0 multi-choice and 0 essay questions. Time allowed 90 minutes.

Category B2-None.

2.18. Subject Module 17 Propeller:

Category A-0 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B1-30 multi-choice and 0 essay questions. Time allowed 40 minutes.

Category B2-None.

Appendix III

Type training and Examination Standard

1. *Type training levels*

The three levels listed below define the objectives that a particular level of training is intended to achieve.

Level 1 General familiarisation

A brief overview of the airframe, systems and powerplants as outlined in the Systems Description Section of the Aircraft Maintenance Manual.

1. Course objectives: Upon completion of the course, the student will be able to identify safety precautions related to the airframe, its systems and powerplant
2. Identify maintenance practices important to the airframe, its systems and powerplant
3. Define the general layout of the aircraft's major systems
4. Define the general layout and characteristics of the powerplant
5. Identify special tooling and test equipment used with the aircraft

Level 2 Ramp and transit

Basic system overview of controls, indicators, principal components including their location and purpose, servicing and minor troubleshooting.

Course objectives: In addition to the information contained in the Level 1 General Familiarisation course, at the completion of this Level 2 Ramp and Transit training, the student will be able to:

1. Recall the safety precautions to be observed when working on or near the aircraft, powerplant and systems.
2. Demonstrate knowledge of the main ramp and transit (through-flight) activities of the following:
   (a) Doors, windows and hatches.
   (b) Electrical power supplies.
   (c) Fuel.
   (d) Auxiliary power unit.
   (e) Powerplant.
   (f) Fire protection.
   (g) Environmental Control Systems.
   (h) Hydraulic power.
   (i) Landing gear.
   (j) Flight controls.
   (k) Water/waste.
   (l) Oxygen.
   (m) Flight and service interphone.
   (n) Avionics.
   (o) Cabin equipment/furnishings.
3. Describe systems and aircraft handling particularly access, power availability and sources.
4. Identify the locations of the principal components.
5. Explain the normal functioning of each major system, including terminology and nomenclature.
6. Perform the procedures for ramp and transit servicing associated with the aircraft for the following systems: Fuel, Power Plants, Hydraulics, Landing Gear, Water/Waste, Oxygen.
7. Demonstrate proficiency in use of crew reports and on-board reporting systems (minor troubleshooting) and determine aircraft airworthiness per the MEL/CDL.

8. Identify and use appropriate documentation.

9. Locate those procedures for replacement of components for ramp and transit activities identified in objective 2.

Level 3 Line and base maintenance training

Detailed description, operation, component location, removal/installation and bite and troubleshooting procedures to maintenance manual level.

Course objectives: In addition to the information contained in Level 1 and Level 2 training, at the completion of Level III Line and Base Maintenance training, the student will be able to:

(a) Perform system, engine, component and functional checks as specified in the maintenance manual.

(b) Correlate information for the purpose of making decisions in respect of fault diagnosis and rectification to maintenance manual level.

(c) Describe procedures for replacement of components unique to aircraft type.

2. *Type training standard*

Type training must include a theoretical and practical element.

2.1. Theoretical element

As a minimum the elements in the Syllabus below that are specific to the aircraft type must be covered. Additional elements introduced due to technological changes shall also be included.

Training levels are those levels defined in paragraph 1 above.

After the first type course for category C certifying staff all subsequent courses need only be to level 1.

Introduction Module Title	
General Aircraft(dimensions/weights MTOW etc) Time limits/maintenance checks Levelling and weighing Towing and taxiing Parking/mooring Servicing Standard practices-only type particular B2 module-safety items/mechanical interface B1 module-safety items/avionics interface	

	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
Blade tracking and vibration analysis	—	—	—	—	3	1	3	1	—
Transmissions	—	—	—	—	3	1	3	1	—
Airframe structure	—	—	—	—	3	1	3	1	1
Main rotor	—	—	—	—	3	1	3	1	—
Tail rotor/rotor drive	—	—	—	—	3	1	3	1	—
Rotor flight control	—	—	—	—	3	1	3	1	—
Airframe Structure	3	1	3	1	—	—	—	—	1
Fuselage Doors	3	1	3	1	—	—	—	—	—
Fuselage	3	1	3	1	—	—	—	—	—
Fuselage Windows	3	1	3	1	—	—	—	—	—
Wings	3	1	3	1	—	—	—	—	—
Stabilisers	3	1	3	1	—	—	—	—	—
Flight Control Surfaces	3	1	3	1	—	—	—	—	—
Nacelles/Pylons	3	1	3	1	—	—	—	—	—

	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
Zonal & Station Identification Systems	1	1	1	1	1	1	1	1	1
Air Supply	3	1	3	1	3	1	3	1	1
Air Conditioning	3	1	3	1	3	1	3	1	1
Pressurisation	3	1	—	—	—	—	—	—	1
Safety & Warning Devices	3	1	—	—	—	—	—	—	1
Instrument Systems	3	1	3	1	3	1	3	1	3
Avionics Systems	2	1	2	1	2	1	2	1	3
Electrical Power	3	1	3	1	3	1	3	1	3
Equipment & Furnishings	3	1	3	1	3	1	3	1	—
Electronic Emergency Equip. Requir. & Cabin Entertainment Equipment	—	1	—	—	—	—	—	—	3
Fire Protection	3	1	3	1	3	1	3	1	1
Flight Controls	3	1	3	1	3	1	3	1	2
Sys. Operation: Electrical/Fly-by-Wire	3	1	—	—	—	—	—	—	3
Fuel Systems	3	1	3	1	3	1	3	1	1
Hydraulic Power	3	1	3	1	3	1	3	1	1
Ice & Rain Protection	3	1	3	1	3	1	3	1	1
Landing Gear	3	1	3	1	3	1	3	1	1
Lights	3	1	3	1	3	1	3	1	3
Oxygen	3	1	3	1	—	—	—	—	1
Pneumatic/Vacuum	3	1	3	1	3	1	3	1	1
Water/Waste	3	1	3	1	—	—	—	—	1
On-board Maintenance Systems	3	1	3	1	—	—	—	—	3
Turbine Engines:									
Constructional arrangement and operation	—	—	—	—	—	—	—	—	1
Engine Performance	3	1	—	—	3	1	—	—	1
Inlet	3	1	—	—	3	1	—	—	—
Compressors	3	1	—	—	3	1	—	—	—
Combustion Section	3	1	—	—	3	1	—	—	—
Turbine Section	3	1	—	—	3	1	—	—	—
Exhaust	3	1	—	—	3	1	—	—	—
Bearings and Seals	3	1	—	—	3	1	—	—	—
Lubricants and Fuels	3	1	—	—	3	1	—	—	—
Lubrication Systems	3	1	—	—	3	1	—	—	—

	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
Fuel Systems	3	1	—	—	3	1	—	—	1
Engine controls	3	1	—	—	3	1	—	—	1
FADEC	2	1	—	—	2	1	—	—	3
Air Systems	3	1	—	—	3	1	—	—	—
Starting & Ignition Systems	3	1	—	—	3	1	—	—	—
Engine Indicating Systems	3	1	—	—	3	1	—	—	3
Power Augmentation Systems	3	1	—	—	—	—	—	—	—
Turbo-prop Engines	3	1	—	—	—	—	—	—	—
Turbo-shaft Engines	—	—	—	—	3	1	—	—	—
Auxiliary Power Units (APUs)	3	1	—	—	—	—	—	—	1
Powerplant Installation	3	1	—	—	3	1	—	—	—
Fire Protection Systems	3	1	—	—	3	1	—	—	1
Engine Monitoring and Ground Operation	3	1	—	—	3	1	—	—	—
Engine Storage and Preservation	3	1	—	—	3	1	—	—	—
Piston Engines:									
Engine Performance	—	—	3	1	—	—	3	1	1
Engine Construction	—	—	3	1	—	—	3	1	1
Engine Fuel Systems	—	—	3	1	—	—	3	1	1
Carburettors	—	—	3	1	—	—	3	1	—
Fuel injection systems	—	—	3	1	—	—	3	1	—
Engine controls	3	1	—	—	3	1	—	—	1
FADEC	—	—	2	1	—	—	2	1	3
Starting and Ignition Systems	—	—	3	1	—	—	3	1	—
Induction, Exhaust and Cooling Systems	—	—	3	1	—	—	3	1	—
Supercharging/Turbocharging	—	—	3	1	—	—	3	1	—
Lubricants and Fuels	—	—	3	1	—	—	3	1	—
Lubrication Systems	—	—	3	1	—	—	3	1	—
Engine Indication Systems	—	—	3	1	—	—	3	1	3
Powerplant Installation	—	—	3	1	—	—	3	1	—
Engine Monitoring and Ground Operation	—	—	3	1	—	—	3	1	—
Engine Storage and Preservation	—	—	3	1	—	—	3	1	—

	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
Propellers:									
Propeller — General	3	1	3	1	—	—	—	—	1
Propeller Construction	3	1	3	1	—	—	—	—	—
Propeller Pitch Control	3	1	3	1	—	—	—	—	—
Propeller Synchronising	3	1	3	1	—	—	—	—	—
Propeller Electronic control	2	1	2	1	—	—	—	—	3
Propeller Ice Protection	3	1	3	1	—	—	—	—	—
Propeller Maintenance	3	1	3	1	—	—	—	—	—

2.2. Practical element

The practical training element must consist of the performance of representative maintenance tasks and their assessment, in order to meet the following objectives:

(a) Ensure safe performance of maintenance, inspections and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for example troubleshooting, repairs, adjustments, replacements, rigging and functional checks such as engine run, etc, if required.

(b) Correctly use all technical literature and documentation for the aircraft.

(c) Correctly use specialist/special tooling and test equipment, perform removal and replacement of components and modules unique to type, including any on-wing maintenance activity.

3. *Type training examination standard*

Where aircraft type training is required, the examination must be written and comply with the following:

1. Format of the examination is of the multiple-choice type. Each multiple-choice question must have three alternative answers of which only one must be the correct answer. The time for answering is based upon a nominal average of 120 seconds per level 3 question and 75 seconds per level 1 or 2 question.

2. The examination must be of the closed book type. No reference material is permitted. An exception will be made for the case of examining a B1 or B2 candidate's ability to interpret technical documents.

3. The number of questions must be at least one question per hour of instruction subject to a minimum of two questions per Syllabus subject. The competent authority of the Member State will assess number and level of questions on a sampling basis when approving the course.

4. The examination pass mark is 75 %.

5. Penalty marking is not to be used to determine whether a candidate has passed.

6. End of module phase examinations cannot be used as part of the final examination unless they contain the correct number and level of questions required.

4. *Type examination standard*

Where type training is not required, the examination must be oral, written or practical assessment based, or a combination thereof.

Oral examination questions must be open.

Written examination questions must be essay type or multiple-choice questions.

Practical assessment must determine a person's competence to perform a task.

Examination subjects must be on a sample of subjects drawn from paragraph 2 type training/examination syllabus, at the indicated level.

The examination must ensure that the following objectives are met:

(a) Properly discuss with confidence the aircraft and its systems.

(b) Ensure safe performance of maintenance, inspections and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for example troubleshooting, repairs, adjustments, replacements, rigging and functional checks such as engine run, etc, if required.

(c) Correctly use all technical literature and documentation for the aircraft.

(d) Correctly use specialist/special tooling and test equipment, perform removal and replacement of components and modules unique to type, including any on-wing maintenance activity.

A written report must be made by the examiner to explain why the candidate has passed or failed.

Appendix IV

Experience requirements for extending a Part-66 Aircraft Maintenance Licence

The table below shows the experience requirements for adding a new category or subcategory to an existing Part-66 licence.

The experience must be practical maintenance experience on operating aircraft in the subcategory relevant to the application.

The experience requirement will be reduced by 50 % if the applicant has completed an approved Part-147 course relevant to the subcategory.

To: / From:	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
A1		6 months	6 months	6 months	2 years	6 months	2 years	1 year	2 years
A2	6 months		6 months	6 months	2 years	6 months	2 years	1 year	2 years
A3	6 months	6 months		6 months	2 years	1 year	2 years	6 months	2 years
A4	6 months	6 months	6 months		2 years	1 year	2 years	6 months	2 years
B1.1	None	6 months	6 months	6 months		6 months	6 months	6 months	1 year
B1.2	6 months	None	6 months	6 months	2 years		2 years	6 months	2 years
B1.3	6 months	6 months	None	6 months	6 months	6 months		6 months	1 year
B1.4	6 months	6 months	6 months	None	2 years	6 months	2 years		2 years
B2	6 months	6 months	6 months	6 months	1 year	1 year	1 year	1 year	

Appendix V

Application Form and Example of Licence Format

This appendix contains an example of the Part-66 aircraft maintenance licence and the relevant application form for such licence.

The competent authority of the Member State may modify the EASA Form 19 to include additional information necessary to support the case where the National requirements permit or require the Part-66 aircraft maintenance licence to be used outside the Part-145 requirement for non-commercial air transport purposes.

APPLICATION FOR INITIAL / AMENDMENT / RENEWAL OF PART-66 AIRCRAFT MAINTENANCE LICENCE (AML)	EASA FORM 19

APPLICANTS DETAILS:

Name: .....

Address: .....

.....

Nationality: ..... Date and Place of Birth .....

Part-66 AML DETAILS (if applicable):

Licence No: ..... Date of Issue: .....

EMPLOYERS DETAILS:

Name: .....

Address: .....

.....

AMO Approval Reference: .....

..... Fax: .....

APPLICATION FOR: (Tick (V) relevant box(es))

Initial AML ☐ Amendment of AML ☐ Renewal of AML ☐

Rating	A	B1	B2	C
Aeroplane Turbine	☐	☐		
Aeroplane Piston	☐	☐		
Helicopter Turbine	☐	☐		
Helicopter Piston	☐	☐		
Reserved	☐	☐		
Reserved	☐	☐		
Avionics			☐	
Aircraft				☐

Type endorsements (if applicable):

.....

.....

.....

.....

I wish to apply for initial / amendment / renewal of Part-66 AML as indicated and confirm that the information contained in this form was correct at the time of application.

I herewith confirm that:

1. I am not holding any Part-66 AML issued in another Member State,

2. I have not applied for any Part-66 AML in another Member State and

3. I never had a Part-66 AML issued in another Member State which was revoked or suspended in any other Member State.

I also understand that any incorrect information could disqualify me from holding a Part-66 AML.

Signed: ..... Name: .....

Date: .....

APPLICATION FOR INITIAL / AMENDMENT / RENEWAL OF PART–66 AIRCRAFT MAINTENANCE LICENCE (AML)	EASA FORM 19

I wish to claim the following credits (if applicable):

Experience credit due Part-147 training

Examination credit due equivalent exam certificates

Enclose relevant certificates

Recommendation (if applicable): It is hereby certified that the applicant has met the relevant maintenance knowledge and experience requirements of Part-66 and it is recommended that the competent authority grants or endorses the Part-66 AML.

Signed: ..... Name: .....

Position: ..... Date: .....

PART-66 AIRCRAFT MAINTENANCE LICENCE

1. An example of the Part-66 aircraft maintenance licence can be found on the following pages.

2. The document must be printed in the standardised form shown but may be reduced in size to accommodate its computer generation if desired. When the size is reduced care should be exercised to ensure sufficient space is available in those places where official seals/stamps are required. Computer generated documents need not have all the boxes incorporated when any such box remains blank so long as the document can clearly be recognised as the Part-66 aircraft maintenance licence.

3. The document may be printed in the English or the official language of the Member State concerned, except that if the official language of the Member State concerned is used, a second English copy must be attached for any licence holder that works outside that Member State to ensure understanding for the purpose of mutual recognition.

4. Each licence holder must have a unique licence number based upon a National identifier and an alpha-numeric designator.

5. The document may have the pages in any order and need not have some or any divider lines as long as the information contained is positioned such that each page layout can clearly be identified with the format of the example Part-66 aircraft maintenance licence contained herein. The aircraft type rating page need not be issued until the first type endorsement is included.

6. The document may be prepared by the competent authority of the Member State or by any Part-145 approved maintenance organisation in accordance with a procedure approved by the Member State and contained in the Part-145 maintenance organisation exposition except that in all cases the competent authority of the Member State will issue the document.

7. The preparation of any variation to an existing Part-66 aircraft maintenance licence may be carried out by the competent authority of the Member State or by any Part-145 approved maintenance organisation in accordance with a procedure approved by the competent authority of the Member State and contained in the Part-145 maintenance organisation exposition except that in all cases the competent authority of the Member State will issue the document with the variation.

8. The Part-66 aircraft maintenance licence once issued is required to be kept by the person to whom it applies in good condition and who shall remain accountable for ensuring that no unauthorised entries are made.

9. Failure to comply with paragraph 8 may invalidate the document and could lead to the holder not being permitted to hold any Part-145 certification authorisation and may result in prosecution under National law.

10. The Part-66 aircraft maintenance licence is recognised in all Member States and it is not necessary to exchange the document when working in another Member State.

11. The annex to EASA Form 26 is optional and may only be used to include National Privileges not covered by Part-66, where such privileges were covered by the national regulation in force prior to the implementation of Part-66.

12. For information the actual Part-66 aircraft maintenance licence issued by the competent authority of the Member State may have the pages in a different order and may not have the divider lines.

13. With regard to the aircraft type rating page the competent authority of the Member State may choose not to issue this page until the first aircraft type rating needs to be endorsed and will need to issue more than one aircraft type rating page when there are a number to be listed.

14. Notwithstanding 13, each page issued will be in this format and contain the specified information for that page.

15. If there are no limitations applicable, the LIMITATIONS page will be issued stating 'No limitations'.

16. Where a pre-printed format is used, any category, subcategory or type rating box which does not contain a rating entry shall be marked to show that the rating is not held.

EUROPEAN UNION

STATE

AUTHORITY NAME & LOGO

Part-66

AIRCRAFT MAINTENANCE LICENCE

THIS LICENCE IS RECOGNISED BY ALL EU MEMBERS

EASA FORM 26

Conditions:

1. This licence must be signed by the holder and be accompanied by an identity document containing a photograph of the licence holder.
2. Endorsement of any (sub)categories on the page(s) entitled Part-66 (SUB)CATEGORIES **only,** does **not** permit the holder to issue a certificate of release to service for an aircraft.
3. This licence when endorsed with an aircraft type rating meets the intent of ICAO annex 1.
4. The privileges of the holder of this licence are prescribed by Part-66 and the applicable requirements of Part-M and Part-145.
5. This licence remains valid until the date specified on the limitation page unless previously suspended or revoked.
6. The privileges of this licence may not be exercised unless in the preceding two year period the holder has had either six months of maintenance experience in accordance with the privileges granted by the licence, or met the provision for the issue of the appropriate privileges.

1. State of issue
2. Licence No:
3. Full name of holder:
4. Date and place of birth:
5. Address of holder:
6. Nationality:
7. Signature of holder:
8. Signature of issuing officer & date:
9. Seal or stamp of issuing Authority:

Part-66 (SUB)CATEGORIES

	A	B1	B2	C
Aeroplanes Turbine			n/a	n/a
Aeroplanes Piston			n/a	n/a
Helicopters Turbine			n/a	n/a
Helicopters Piston			n/a	n/a
Avionics	n/a	n/a		n/a
Aircraft	n/a	n/a	n/a	
Reserved				

Lic No:

Part-66 AIRCRAFT TYPE RATINGS		
A/C Type or Group	Category	Official Stamp & Date
LIC NO:		

Part-66 LIMITATIONS
Valid until:
LIC NO:

Annex to EASA Form 26

National privileges outside the scope of Part 66, in accordance with [National Legislation] (Valid only in *[Member State])*

Official Stamp & Date

LIC NO:

Intentionally Left Blank